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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/612,133	07/02/2003	Mervyn John Miles	SHP-PT077	3323

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EXAMINER	
LUU, THANH X	
ART UNIT	**PAPER NUMBER**
2878	

DATE MAILED: 04/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

EK

Office Action Summary	Application No.	Applicant(s)	
	10/612,133	MILES ET AL.	
	Examiner	Art Unit	
	Thanh X. Luu	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 March 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19 and 21-23* is/are pending in the application.

4a) Of the above claim(s) *22* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19,21 and 23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 February 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 27, 2006 has been entered.

Claims 1-19 and 21-23 are currently pending. Claim 22 has been withdrawn.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

3. The disclosure is objected to because of the following informalities:

Applicant has failed to describe Fig. 4 in the detailed description of the invention section of the specification.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1-19, 21 and 23 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject

matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding the claims, it appears that the term "non-localized" constitutes new matter. Nowhere in the original specification is such a term found. Furthermore, it is unclear what it means as Applicant has failed to use such a term before.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-19, 21 and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 1-19, 21 and 23, it is unclear in its given context what it means to have "non-localized" oscillatory motion. Applicant has failed to use or define the term anywhere in the original specification.

Regarding claim 17, it is unclear how providing a linear translation of the probe and sample in a direction orthogonal to a plane in which the probe is (laterally) oscillated, defines a rectangular scan area. As understood, such a linear translation of the probe only moves the probe vertically (up and down; orthogonal to the lateral oscillation plane).

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 21 and 23, as understood, are rejected under 35 U.S.C. 102(b) as being anticipated by Betzig (U.S. Patent 5,254,854).

Regarding claim 23, Betzig discloses (see Figs. 1 and 8) a scanning probe microscope and method for scanning a sample by means of interaction between the sample and the probe, comprising: driving means (50, 40) arranged to provide relative motion between the probe and the sample surface and capable of bringing the same and probe into close proximity; means for oscillating (40) either the probe or the sample in order to provide relative oscillatory motion (160; see Fig. 8 and col. 3, lines 10-12) of the probe across the surface; and at least one of a probe detection mechanism (80) arranged to measure at least one parameter indicative of strength of the interaction between the probe and the sample for imaging the sample; the microscope is arranged, in operation, to carry out a scan of the sample surface wherein scan area is covered by an arrangement of scan lines (see generally Fig. 8), each scan line (not shown) provided by laterally oscillating (see col. 3, lines 10-12) either the probe or the sample near resonant frequency (see col. 3, lines 25-30). The oscillation amplitude inherently determines a maximum scan line length.

Regarding claim 21, Betzig discloses the claimed invention as set forth above. Betzig further discloses (see col. 5, lines 35-50) monitoring a parameter (shear force) and adjusting the separation distance (height of the tip above the sample) in order to drive the value of the monitored parameter back towards the set value (constant shear

force).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 1, 3 and 12-18, as understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Betzig in view of Elings (U.S. Patent 6,008,489).

Regarding claims 1, 3, 12, 14, 17, and 18, Betzig discloses the claimed invention as set forth above. Betzig also disclose (see col. 3, lines 10-15) the parameter is an oscillation amplitude; and (see Fig .8) scanning a rectangular area as claimed. Betzig does not specifically disclose responding to a variation in an average value of the at least one parameter. Elings et al. teach (see claim 48) averaging values. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide average values in the apparatus and method of Betzig in view of Elings et al. to provide more accurate and precise adjustment and detection.

Regarding claims 13 and 15, Betzig in view of Elings et al. disclose the claimed invention as set forth above. Betzig and Elings et al. do not specifically disclose a tuning fork as claimed. However, choosing a particular type of oscillator is a matter of design choice. Furthermore, tuning forks are notoriously well known in the art. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to choose a tuning fork as claimed in the apparatus and method of Betzig in view

of Elings et al. to provide more stability as well known.

Regarding claim 16, Betzig in view of Elings et al. disclose the claimed invention as set forth above. Betzig and Elings et al. do not specifically disclose a time constant as claimed. However, choosing a particular time constant is a matter of design choice. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to choose time constant values as claimed in the apparatus and method of Betzig in view of Elings et al. to sufficiently react to changing conditions and obtain improved detection.

12. Claims 1-4, 6-19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kley (U.S. Patent 6,752,008) in view of Betzig and Elings et al.

Regarding claims 1, 3, 7-12, 14 and 21, Kley discloses (see Figs. 1 and 3) a scanning probe microscope and method for scanning a sample by means of interaction between the sample and the probe, comprising: driving means (22) arranged to provide relative motion between the probe and the sample surface and capable of bringing the same and probe into close proximity; means for oscillating (18) either the probe or the sample in order to provide relative oscillatory motion (see Fig. 3) of the probe across the surface; and at least one of a probe detection mechanism (24) arranged to measure at least one parameter indicative of strength of the interaction between the probe and the sample for imaging the sample; the microscope is arranged, in operation, to carry out a scan of the sample surface wherein scan area is covered by an arrangement of scan lines (see Fig. 3), each scan line provided by laterally oscillating either the probe or the sample at a frequency. The oscillation amplitude inherently (see Fig. 3) determines a

maximum scan line length. Kley also discloses (see Figs.) an AFM cantilever and actuator as claimed. Kley does not specifically disclose a feedback mechanism or oscillating at or near a resonant frequency. Betzig teaches (see col. 3, lines 25-30 and col. 5, lines 35-50) oscillating a resonant frequency and providing feedback as claimed. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide feedback and oscillate a resonant frequency in the apparatus and method of Kley in view of Betzig for improved stability. Kley also does not specifically disclose responding to a variation in an average value. Elings et al. further teach (see claim 48) averaging values. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide average values in the apparatus and method of Kley in view of Betzig and Elings et al. to provide more accurate and precise adjustment and detection.

Regarding claims 2, 4 and 17-19, Kley in view of Betzig and Elings et al. disclose the claimed invention as set forth above. Kley does not specifically disclose measuring capacitance. Elings et al. further teach (see col. 1, line 26) that it is conventional to measure deflection by measuring capacitance. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to measure capacitance in the apparatus and method of Kley in view of Betzig and Elings et al. as desired for efficient and effective deflection detection.

Regarding claim 6, Kley in view of Betzig and Elings et al. disclose the claimed invention as set forth above. Kley does not specifically disclose measuring a magnetic field. Elings et al. further teach (see col. 2, lines 35-40) that it is conventional to use

such probes to measure magnetic fields. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to measure magnetic fields in the apparatus and method of Kley in view of Betzig and Elings et al. to provide further functionality as desired.

Regarding claims 13, 15, 18 and 19, Kley in view of Betzig and Elings et al. disclose the claimed invention as set forth above. Kley, Betzig and Elings et al. do not specifically disclose a tuning fork as claimed. However, choosing a particular type of oscillator is a matter of design choice. Furthermore, tuning forks are notoriously well known in the art. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to choose a tuning fork as claimed in the apparatus and method of Kley in view of Betzig and Elings et al. to provide more stability as well known.

Regarding claim 16, Kley in view of Betzig and Elings et al. disclose the claimed invention as set forth above. Kley, Betzig and Elings et al. do not specifically disclose a time constant as claimed. However, choosing a particular time constant is a matter of design choice. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to choose time constant values as claimed in the apparatus and method of Kley in view of Elings et al. to sufficiently react to changing conditions and obtain improved detection.

13. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kley in view of Betzig and Elings et al., and further in view of Ookubo (U.S. Patent 6,614,227).

Regarding claim 5, Kley in view of Betzig and Elings et al. disclose the claimed invention as set forth above. Kley, Betzig and Elings et al. do not specifically disclose the specific capacitance probe detection mechanism as claimed. Ookuba teaches (see Fig. 9) a capacitance probe detection mechanism having a resonator (101) and voltage modulator (201, 202) as claimed. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide such a configuration as claimed in the apparatus and method of Kley in view of Betzig and Elings et al. to effectively implement capacitance detection as desired for deflection detection.

Response to Arguments

14. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh X. Luu whose telephone number is 571-272-2441. The examiner can normally be reached on M-F 6:00AM-3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 571-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thanh X Luu
Primary Examiner
Art Unit 2878

03/2006